

REMARKS

In the Office Action dated February 12, 2004, claims 1-43 were rejected under 35 U.S.C. § 103 over U.S. Patent No. 5,960,423 (Chaudhuri).

As amended, claim 1 is allowable over Chaudhuri. Claim 1 recites a test system that includes an emulation module to receive environment information of a database system separate from the test system, the emulation module to emulate an environment of the database system based on the environment information. The test system further includes a first module *executable in the emulated environment* and adapted to receive a set of queries and to provide a set of candidate indexes for the set of the queries, the first module to eliminate one or more candidate indexes based on one or more predetermined criteria. A second module *executable in the emulated environment* is adapted to generate a recommended index from the set of candidate indexes.

Chaudhuri does not teach a test system (separate from a database system) that has an emulation module to emulate the environment of the database system. With respect to dependent claims 36-39, the Office Action noted that Chaudhuri teaches a test system separate from a database system and that imports environment information. 2/12/2004 Office Action at 7. The Office Action cited to column 5, line 55 to column 6, line 54, and to column 16, line 43 to column 17, line 53 of Chaudhuri. The passage at column 5, line 55 to column 6, at line 54, describes an embodiment of the database system 200 of Chaudhuri. However, the passage makes no mention whatsoever of a test system separate from a database system for receiving environment information and for emulating the environment of the database system based on the environment information. The cited passage at columns 16 and 17 describes candidate index selection for a workload-- however, the cited passage makes no mention of receiving environment information of a database system separate from a test system, and emulating the environment of the database system based on the environment information. No other section of Chaudhuri refers to the emulation of a database system. Therefore, claim 1 is not obvious over Chaudhuri.

Claim 7 has been amended from dependent form to independent form, with the scope of the claim remaining *unchanged*. Claim 7 recites a first module to eliminate one

or more candidate indexes based on one or more predetermined criteria, where the one or more predetermined criteria comprises the threshold change rate, and where the first module is adapted to eliminate one or more candidate indexes having a change rate exceeding the threshold change rate. The Office Action cited to a passage at column 6, lines 35-54, of Chaudhuri. The cited passage refers to selecting an effective set of indexes for index configuration 302 to help minimize the cost of executing workload 304 against database 210. This, however, does not constitute eliminating one or more candidate indexes having a change rate exceeding the threshold change rate, as recited in claim 7. The Office Action also cited to the passage at column 20, line 18 through column 21, line 57. The cited passage refers to index configuration enumeration, which involves determining whether a current index configuration contains less than a predetermined number of indexes, and if so, determining whether the addition of any one of remaining candidate indexes that are not already a member of the current index configuration would further reduce the total cost of a workload. The cited passage also refers to a greedy enumeration algorithm that includes an exhaustive phase to help capture index interactions. The cited passage also mentions that the index configuration enumeration selects one or more seed index configurations. However, nowhere within the cited passage (or anywhere else in Chaudhuri) is there any reference to eliminating one or more candidate indexes having a change rate exceeding a threshold change rate. Therefore, claim 7 is also not obvious over Chaudhuri.

Independent claim 22 has been amended to recite a method that comprises receiving a workload containing a set of the queries of a database system, the database system being *a parallel database system having a plurality of access modules and storage modules, the access modules to manage parallel access of tables in corresponding storage modules*. The method further comprises invoking an optimizer to provide cost analysis for the set of candidate indexes *in the parallel database system* to generate the recommended index from the set of candidate indexes. Receiving a workload containing a set of queries of a parallel database system having a plurality of access modules to manage parallel access of tables, and invoking an optimizer to provide cost analysis for the set of candidate indexes *in the parallel database system* is not taught or suggested by Chaudhuri. Although Chaudhuri states that the purported invention may

be practiced in a multiprocessor system or a distributed computing environment (column 4, lines 30-36), there is no mention whatsoever in Chaudhuri of receiving a workload containing a set of queries of a parallel database system having a plurality of access modules to manage access of tables in corresponding storage modules, and to invoke an optimizer to provide cost analysis for the set of candidate indexes in the parallel database system.

Claim 27 has been amended from dependent form to independent form, with the scope of the claim remaining *unchanged*. Claim 27 recites providing graphical user interface screens to receive user input for selecting the recommended index, including displaying an activatable item to perform workload identification to identify the workload. With respect to claim 27, the Office Action cited the passage in column 4, line 21 to column 5, line 55, of Chaudhuri. Although the cited passage refers to program modules, input devices to receive user commands and information, and a monitor 147 or other type of display device, the cited passage makes no mention of a graphical user interface screen that displays an activatable item to perform workload identification to identify the workload. Therefore, claim 27 is not obvious over Chaudhuri.

Independent claim 37 has been amended from dependent form to independent form, with the scope of the claim remaining *unchanged*. Claim 37 also recites importing environment information of a database system into a test system to emulate the database system in the test system, where invoking the optimizer is performed in the test system that is separate from the database system. Such a feature is not disclosed or suggested by Chaudhuri.

Claim 40 has been amended to recite that eliminating candidate indexes based on one or more predetermined criteria includes at least one of: (1) eliminating candidate indexes that are changed with updates at a rate greater than a predetermined change rate threshold, and (2) eliminating a candidate index that is a subset of another candidate index. Although Chaudhuri refers to reducing the number of index configurations for evaluation of the index selection tool 300, Chaudhuri makes no mention whatsoever of eliminating candidate indexes based on either one of the two criteria mentioned in claim 40.

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Dependent claims are allowable for at least the same reasons as corresponding independent claims. In view of the foregoing, allowance of all claims is respectfully requested. The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 50-1673 (10150).

Respectfully submitted,



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